Optical illusions show vision in a new light

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Optical illusions have fascinated humans throughout history. Greek builders used an optical illusion to ensure that that their columns appeared straight (they built them with a bulge) and we are all intrigued by the mental flip involved in the case of the young girl/old woman faces. New research published in BioMed Central's open access journal *BMC Neuroscience* demonstrates a more serious use of these illusions in understanding how the brain assesses relative size.

Researchers from University College London looked at two well known illusions: the Ebbinghaus illusion, where an object surrounded by small circles appears bigger than the same object surrounded by bigger circles, and the Ponzo illusion, where an object within converging lines (like train tracks or a corridor) is perceived to be larger than a same sized object nearer to the observer.

Their results show that the Ponzo illusion holds true regardless of which eye is used or whether the environmental clues are presented to a different eye than the objects. This suggests that our clues about relative size at a distance are determined after the two-dimensional images seen by the eyes have been processed into a single, three-dimensional, image. In contrast the Ebbinghaus illusion does not work as well if the central object is presented to a different eye than the surrounding circles and shows that determination of an object's size relative to others in the same plane occurs before three-dimension processing.

Chen Song said, "Although our perception of size is distorted by environmental clues, this study shows that the extent of distortion and

the brain mechanisms involved are dependent on the type of environmental contexts."

So while celebrity illusionists retain their ability to fool us, scientists can use these visual tricks to further our understanding of how we relate to the world around us – and have some fun at the same time!

More information: Interocular induction of illusory size perception, Chen Song, D. Samuel Schwarzkopf and Geraint Rees, *BMC Neuroscience* (in press)

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